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# 动态增强MRI半定量参数预测乳腺癌新辅助化疗疗效

# Semi-quantitative dynamic contrast enhanced MRI for prediction of response to neoadjuvant chemotherapy of breast cancer

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中文摘要:

目的 探讨动态对比增强MRI(DCE-MRI)半定量参数预测乳腺癌新辅助化疗(NAC)疗效的价值。方法 对48例经核芯针穿刺证实为乳腺浸润性癌的患者分别于NAC前和NAC 2周期后行DCE-MRI,采用两种ROI选取方法($ROI_{whole}$法和$ROI_{hs}$法)测量最大线性斜率($S_{max}$)、第二期强化程度($SI_2$%)和峰值强化程度($SI_{peak}$%)。按照Miller & Payne病理疗效分级系统,将患者分为组织学非显著反应(NMHR)组和组织学显著反应(MHR)组,比较两组 NAC 2周期后各参数的变化值及两种方法测得的参数预测乳腺癌NAC疗效的ROC曲线下面积。结果 48例中,NMHR组35例,MHR组13例。MHR组中应用$ROI_{whole}$法测得的$S_{max}$、$SI_2$%和$SI_{peak}$%的变化值分别为-54.6%(-86.8%~-19.8%)、-54.5%(-88.5%~-13.3%)和-23.3%(-63.5%~28.1%),NMHR组应用$ROI_{whole}$法得到的参数变化值分别为-14.7%(-68.8%~113.8%)、-18.7%(-74.3%~228.6%)和1.0%(-54.5%~29.6%),差异有统计学意义($P$均<0.05);MHR组应用$ROI_{hs}$法测得的参数变化值分别为-57.3%(-82.2%~15.3%)、-41.1%(-84.3%~-16.8%)和-19.3%(-58.0%~5.8%),NMHR组应用$ROI_{hs}$法得到的参数变化值分别为-10.5%(-49.4%~130.8%)、-13.0%(-55.1%~216.7%)和-3.9%(-55.7%~51.2%), 差异亦有统计学意义($P$均<0.01)。两种方法测得的$S_{max}$、$SI_2$%和$SI_{peak}$%的变化值预测NAC疗效的ROC曲线下面积的差异无统计学意义($P$=0.85、0.61和0.84)。结论 DCE-MRI半定量参数可早期预测乳腺癌NAC的疗效;ROI选取方法对参数预测价值的影响不大。

英文摘要:

**Objective** To explore the value of semi-quantitative parameters in dynamic contrast enhanced MRI (DCE-MRI) for predicting final pathologic response in primary breast cancer patients who underwent neoadjuvant chemotherapy (NAC). **Methods** Totally 48 patients with pathologically proved infiltrating ductal carcinoma through core needle puncture biopsy underwent DCE-MRI before NAC and 2 cycles after the beginning of treatment. Semi-quantitative parameters ($S_{max}$, $SI_2$% and $SI_{peak}$%) were obtained by two ROI methods ($ROI_{whole}$ and $ROI_{hs}$). The patients were categorized as non-major histological response (NMHR) group and major histological response (MHR) group according to histological response evaluated using Miller & Payne system. The changes of semi-quantitative parameter 2 cycles after NAC were compared between MHR group and NMHR group. Areas under ROC for parameters predicting NAC were compared between $ROI_{whole}$ and $ROI_{hs}$. **Results** Among 48 patients, 35 were grouped into NMHR group and 13 into MHR group. Changes in kinetic parameters ($S_{max}$, $SI_2$% and $SI_{peak}$%) obtained by $ROI_{whole}$ were -54.6% (-86.8% to -19.8%), -54.5% (-88.5% to -13.3%) and -23.3% (-63.5% to 28.1%) in MHR group, while were -14.7% (-68.8% to 113.8%), -18.7% (-74.3% to 228.6%) and 1.0% (-54.5% to 29.6%) in NMHR group, respectively (all $P$<0.05). Changes of kinetic parameters obtained by $ROI_{hs}$ were -57.3% (-82.2% to 15.3%), -41.1% (-84.3% to -16.8%) and -19.3% (-58.0% to 5.8%) in MHR group, while were -10.5% (-49.4% to 130.8%), -13.0% (-55.1% to 216.7%) and -3.9% (-55.7% to 51.2%) in NMHR group, respectively (all $P$<0.01). No significant difference of areas under ROC curve for kinetic parameters predicting NAC between the two ROI methods ($ROI_{whole}$ and $ROI_{hs}$) was found ($P$=0.85, 0.61 and 0.84). **Conclusion** Semi-quantitative dynamic parameters of DCE-MRI can predict final pathologic response of primary breast cancer 2 cycles after NAC. ROI methods have no obvious impact on DCE-MRI semi-quantitative parameters.

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